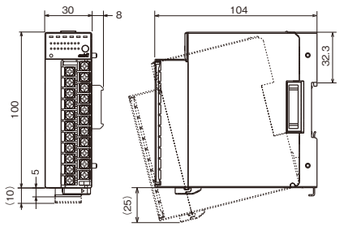
## Digital Output Module ··· Digital output module (16 outputs)

### Model Selection

| Basic model No. | Type | Ring connection | Wiring method | Channels | Option | Addition | Description |
|---|---|---|---|---|---|---|---|
| NX– | | | | | | | Network Instrumentation Module |
| | DY1 | | | | | | Digital output (Transistor output sink type) |
| | DY2 | | | | | | Digital output (Transistor output source type) |
| | | N | | | | | Non-ring connection |
| | | R | | | | | Ring connection |
| | | | T | | | | Screw terminal block |
| | | | S | | | | Screwless terminal block |
| | | | | 16 | | | 16 channels |
| | | | | | 0 | | None |
| | | | | | | 0 | None |
| | | | | | | D | Inspection certificate |
| | | | | | | T | Tropicalization treatment |
| | | | | | | K | Anti-sulfide treatment |
| | | | | | | B | Tropicalization treatment + inspection certificate |
| | | | | | | L | Anti-sulfide treatment + inspection certificate |

### External dimensions

(unit: mm)




### Specifications overview

**Individual specifications**

**Output specifications**

| | |
|---|---|
| Number of outputs | 16 |
| Common terminal | One for every eight channeles |
| Isolation between channels | Channels 1-8 isolated from 9-16 |
| External power rated voltage | 24 Vdc |
| Allowable output current | 100 mAdc max./1ch |
| Output type | DY1:Transistor(sink type)<br>DY2:Transistor(source type) |

**Event output**

| | |
|---|---|
| Number of outputs | 1 |
| Insulation | Yes |
| Output type | Photo MOS relay output (non-voltage from A contact) |
| Rated contact voltage | 12-24 Vdc |
| Allowable output current | 100 mAdc max. |

**Other**

| | |
|---|---|
| Power consumption | 4W max. (under operating conditions) |

**Communication specifications**

**Ethernet**

| | |
|---|---|
| Protocol | MODBUS/TCP, CPL/TCP |

**RS-485**

| | |
|---|---|
| Protocol | MODBUS (RTU/ASCII) CPL |
| Signal level | RS-485 – compliant |
| Communication /synchronization type | Half-duplex, start/stop synchronization |
| Maximum cable length | 500 m |
| Terminating resistor | External (150 Ω, 1/2 W min.) |
| Transmission speed | 115,200 bps max. |

CE : Product approved with the CE Marking. cULus : Product listed by UL covering CSA requirements. : These products are compliant with Korean safety standards.

Peripheral tools

## Engineering Tools ··· Tools for monitoring and initial configuration

| Model No. | Name |
|---|---|
| SLP-NX-J70 | Smart Loader Package (with dedicated cable) |
| SLP-NX-J71 | Smart Loader Package (without cable) |

## PID Simulator ··· An engineering tool equipped with a process simulator

| Model No. | Name |
|---|---|
| SLP-NX-J70PRO | Smart Loader Package + PID Simulator (with dedicated cable) |
| SLP-NX-J71PRO | Smart Loader Package + PID Simulator (without dedicated cable) |

## Parts

| Model No. | Name |
|---|---|
| 80700225-010 | Side connector cover (for internal thread, 10 pcs.) |
| 80700224-010 | Side connector cover (for external thread, 10 pcs.) |

Please, read 'Terms and Conditions' from following URL before the order and use.
**http://www.azbil.com/products/bi/order.html**



Azbil Corporation
Advanced Automation Company

*Yamatake Corporation changed its name to Azbil Corporation on April 1, 2012.*

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan
URL: http://www.azbil.com

1st Edition: May. 2010-KS
4th Edition: Aug. 2015-SO

CP-PC-1492E





azbil

# Network Instrumentation Module

## Better Networks for Better Results

GOOD DESIGN

# Enter the World of New Instrumentation

The PID controller has evolved,
and long-awaited instrumentation
for connecting networks has arrived.




1

2

3


4


5

6

1. All modules have LED indicators for easy viewing of operation status. 2. Compact and highly functional supervisor module 3. Easy to operate, and can also be used as a standalone units. 4. I/O signals can be exchanged between modules (except NX-D15). 5. With work efficiency as a key design principle, modules can be installed and uninstalled without using tools. 6. Daisy chain Ethernet connection saves space and reduces wiring.

# Network Instrumentation Module

Network Instrumentation Module offer advanced control technology
using networks to meet customers' requirements.

Communication

## Support for High-capacity Communication

Ethernet interface is standard in all modules, allowing high-speed communication with a variety of devices. Full-scale distributed deployment is achieved through distribution of functions, saving space and reducing wiring. Batch management of multiple devices through Ethernet communication improves engineering efficiency.

Command

## Optimization Management

The supervisor module coordinates multiloop cooperative control between the modules.

Control

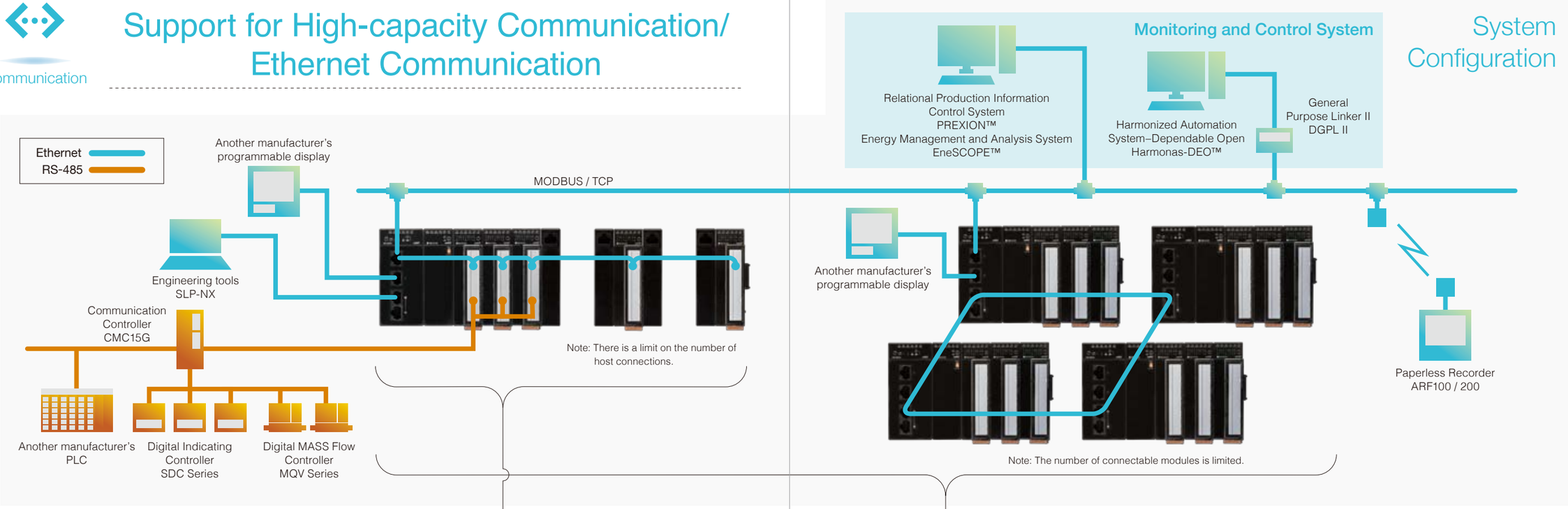
## More Environmentally Friendly Control

Highly sensitive process control that is also environmentally friendly. Process simulation facilitates optimal control.

Communication

# Support for High-capacity Communication/ Ethernet Communication

## System Configuration



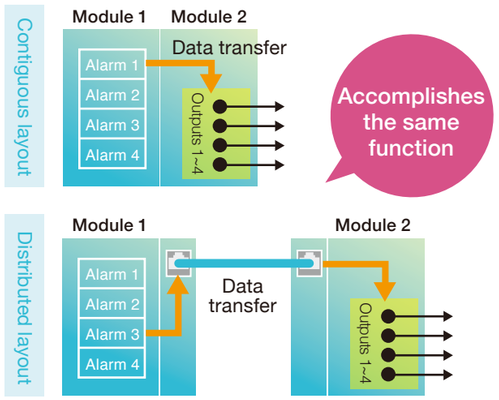

## Communication 1 Standard Ethernet Hardware

Each module can communicate through Ethernet.
High-speed communications at up to 100 Mbps.

- Whether modules are linked or dispersed, wiring can be greatly reduced by using a daisy chain configuration.
- Each module also has an RS-485 communication function.
  RS-485 and Ethernet communications can be used at the same time.
- Modules are capable of high-speed communications with host systems, programmable logic controllers (PLCs), display devices, etc.
- A network equipped with Network Instrumentation Modules can be upgraded to use Azbil Corporation's monitoring and control system.

## Communication 2 Full-fledged Distributed Layout

With Ethernet connections, there is no difference in function between distributed and contiguous layouts.



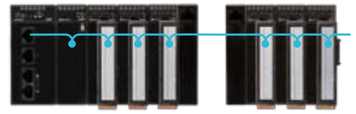

## Communication 3 Redundant Communications

Either ring or non-ring connection is possible on an Ethernet network.

**Type A**

### A non-ring connection

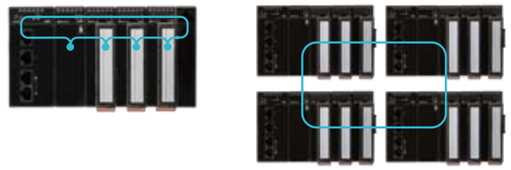
is a daisy chain connection.

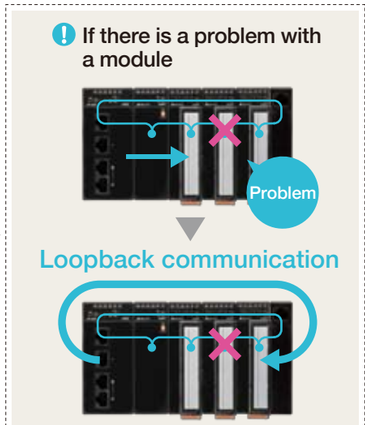


**Type B**

### Ring connection

An Ethernet network in a ring topology. If an error occurs along the communication path, loopback ensures communications.



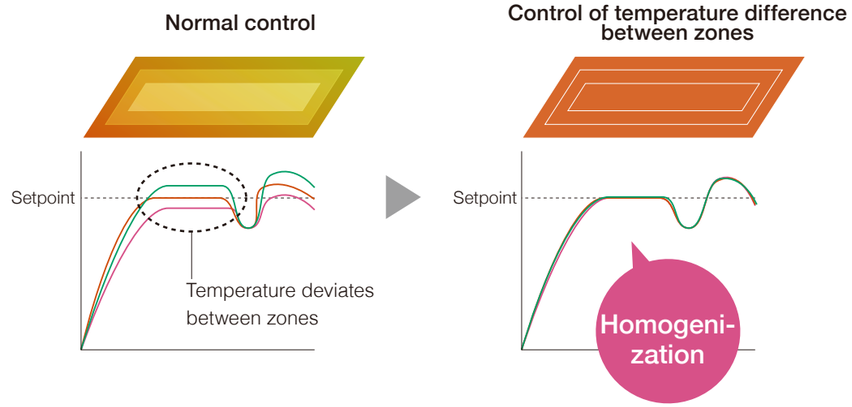


Command

# Optimization Management

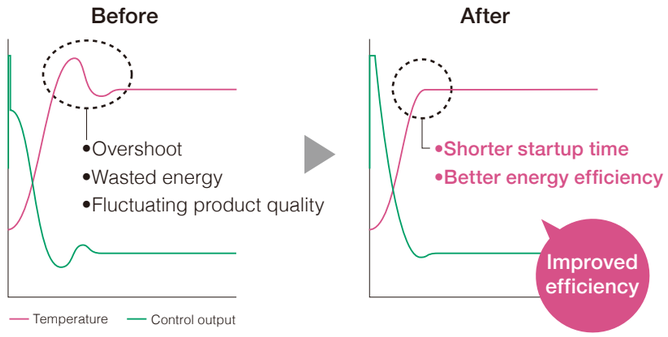
## Command 1 Control of Temperature Difference between Zones

Mutual interference among multiple control loops is prevented, and a constant difference in temperature is maintained between the controlled variables (temperatures) of the loops when the temperature is rising or when responding to disturbances. Yield can be expected to improve due to energy savings and quality improvement.




## Command 2 Process Simulation (PID Simulator)

PID Simulator collects Process Variable (PV) and Manipulated Variable (MV) and reproduces the equipment's characteristics on a personal computer.
The optimum PID values and the start-up characteristics of the equipment can be adjusted on the PC.




**Better control characteristics**
Overshoot suppression and disturbance response characteristics can be freely adjusted.

**Fewer man-hours required for adjustment**
Shorter adjustment time for equipment like large heat treating furnaces.

**Energy control**
By setting an appropriate PID, energy loss is minimized.

**Available controller modules:** ● NX-D25 ● NX-D35

Note: Some processes may not be suitable for PID Simulator use.



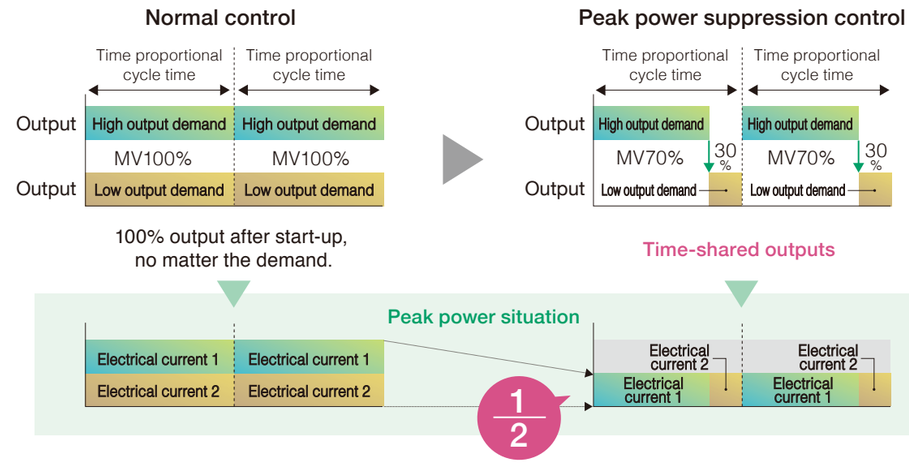


Control

# More Environmentally Friendly Control

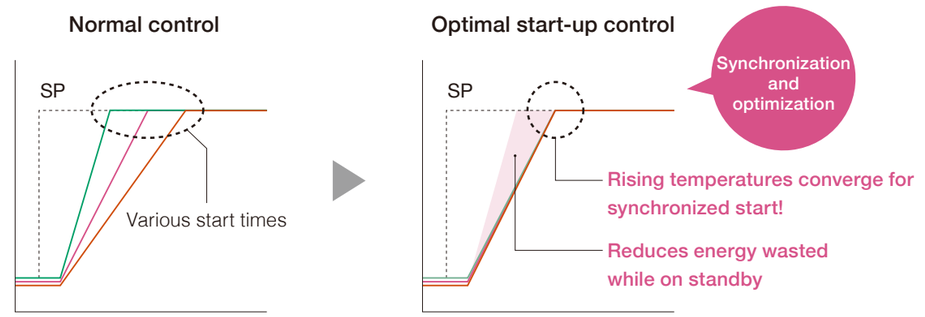
## Control 1 Peak Power Suppression Control

This function controls peak power by means of time-sharing of the output of 2 loops within the time proportional output cycle time.
The supervisor module selects the optimal loop combination from multiple loops.
Peak power for start-up heating is dramatically reduced (up to 50 %).




## Control 2 Optimal Start-up Control

Synchronized or optimized start-up control reduces energy losses.
When fast and slow rising loops coexist in the same equipment or process (multiple pieces of equipment), this helps greatly in reducing energy consumption.

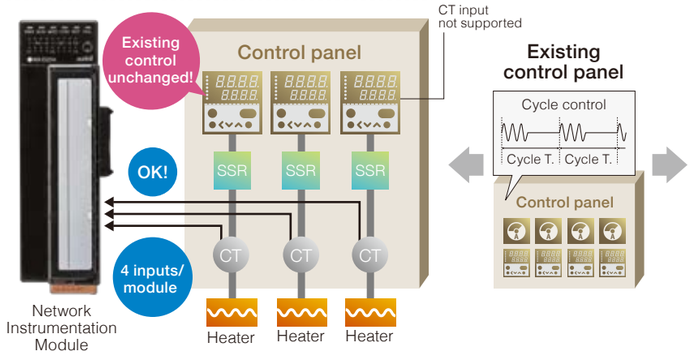


# Advanced Functions

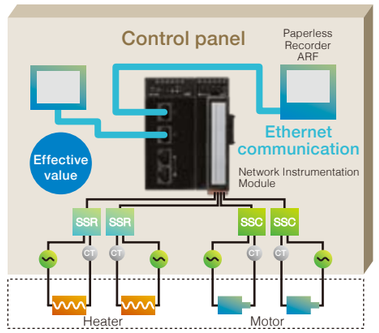
## Function 1 Measurement of AC Current (RMS)

- Up to four current transformer inputs (optional)
- Both phase-controlled and cycle-controlled heater current
- Other AC current (fan, compressor, etc. load current) can also be measured

### Type A Added as a measuring instrument



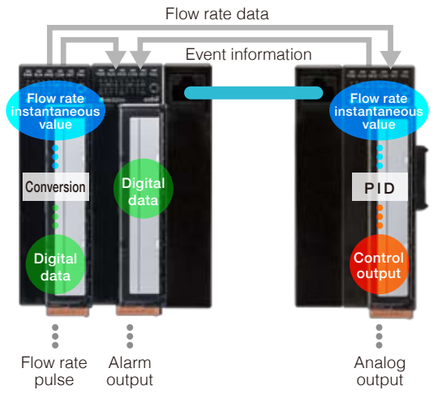

### Type B Control panel upgraded with Network Instrumentation Module




SSR: solid state relay. SSC: solid state contactor.
CT : current transformer.

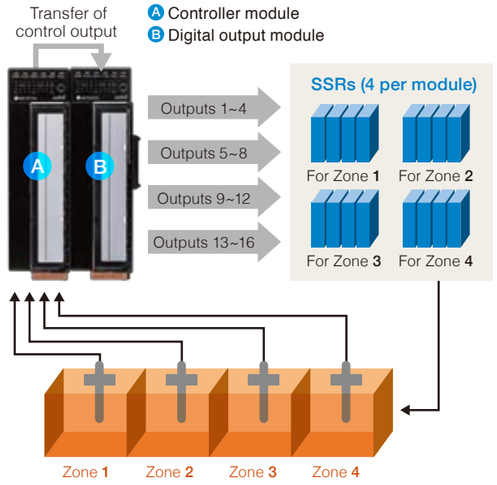
## Function 2 Data Transfer between Modules

- Analog/digital values, etc. can be exchanged between modules.
- Data update frequency of 400 ms.
- Data can be sent to 4 modules (max.) from a single module.




Note: Does not apply to supervisor modules.

- Multi-point control of heater is also possible (e.g., for continuous tunnel furnace [see figure below]).

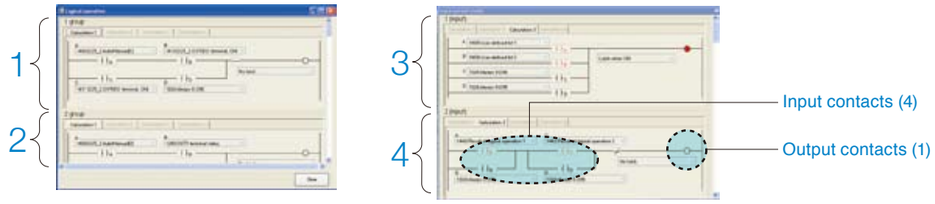




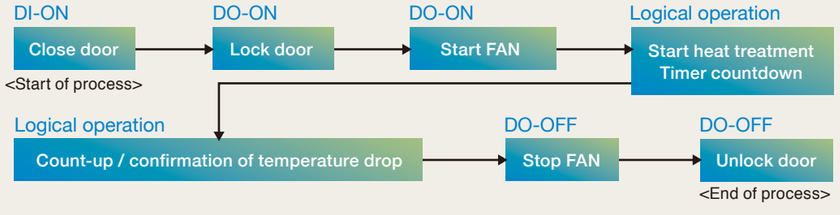

## Function 3 Logical Operations (simple logic)

- Up to 32 logical operations with a circuit containing 4 inputs and 1 output can be preset (NX-DY).
- Logical operations can be selected from among 4 types.
- Simple logical actions can be carried out by combining logical operations.

**Types of logical operations (4)**

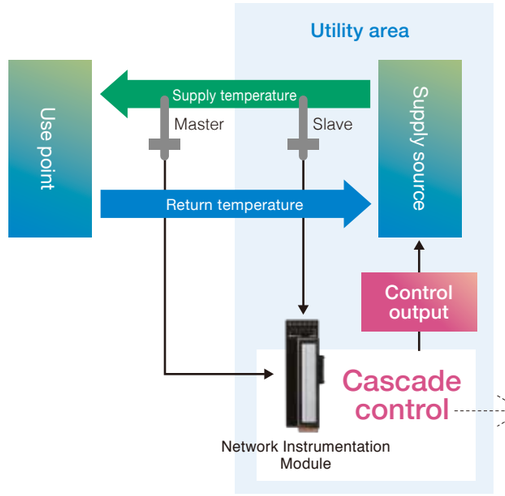



**Logic diagram**



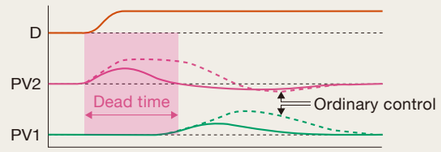

## Function 4 Cascade Control

- Improves the controllability of control systems that have a large amount of dead time.




### Effectiveness of cascade control

In an ordinary control system, if a disturbance (D) occurs, the controlled variable (PV1) changes after the dead time elapses and then corrective action is taken by the feedback control starting from this point. In a cascade control system, the controlled variable (PV2) in the secondary control system changes immediately and corrective action starts at this point, resulting in less variation of the controlled variable (PV1) in the primary control system.

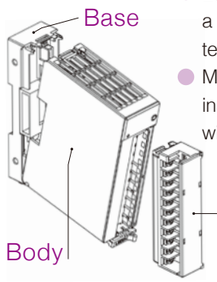


# Hardware

## Hardware 1 Small but Mighty

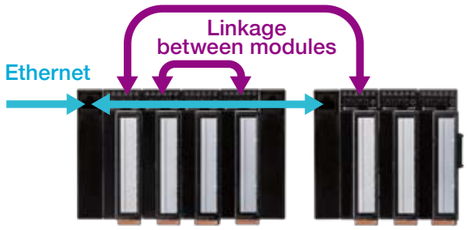
- Compact body (30 x 100 x 104 mm)
- Up to 4 analog inputs and 4 analog outputs
- 4 current transformer inputs (option)
- High accuracy: 0.1% FS*
- High-speed sampling: 100 ms*
  (*for NX-D35)

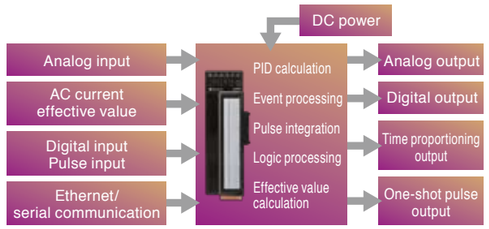

## Hardware 2 Easy Assembly




- Each module consists of a base, a body, and a terminal block.
- Modules can be easily installed and uninstalled without tools.

## Hardware 3 Flexible Layout



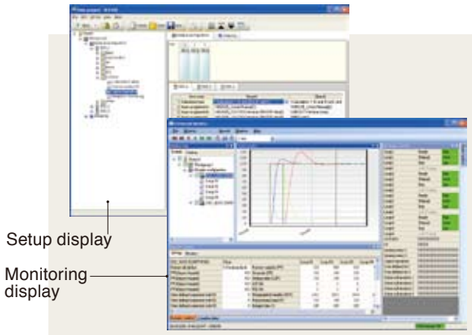




### Contiguous modules or distributed layout

- Input/output signals can be shared between modules.
  * Using Ethernet connections, wiring (for communications) is reduced and space is saved.
- In a distributed layout, modules can be linked as well as when they are physically contiguous.

### Stand-alone modules

- Power supply, control, and communication functions are consolidated into 1 module.
- In addition to PID control, standalone modules can monitor analog values, totalize flow rate based on pulse input, and perform simple logical actions via digital I/O (available functions differ depending on the module).
- Module are operated based on parameter settings only, making them simpler to operate than a PLC.




### Engineering tools

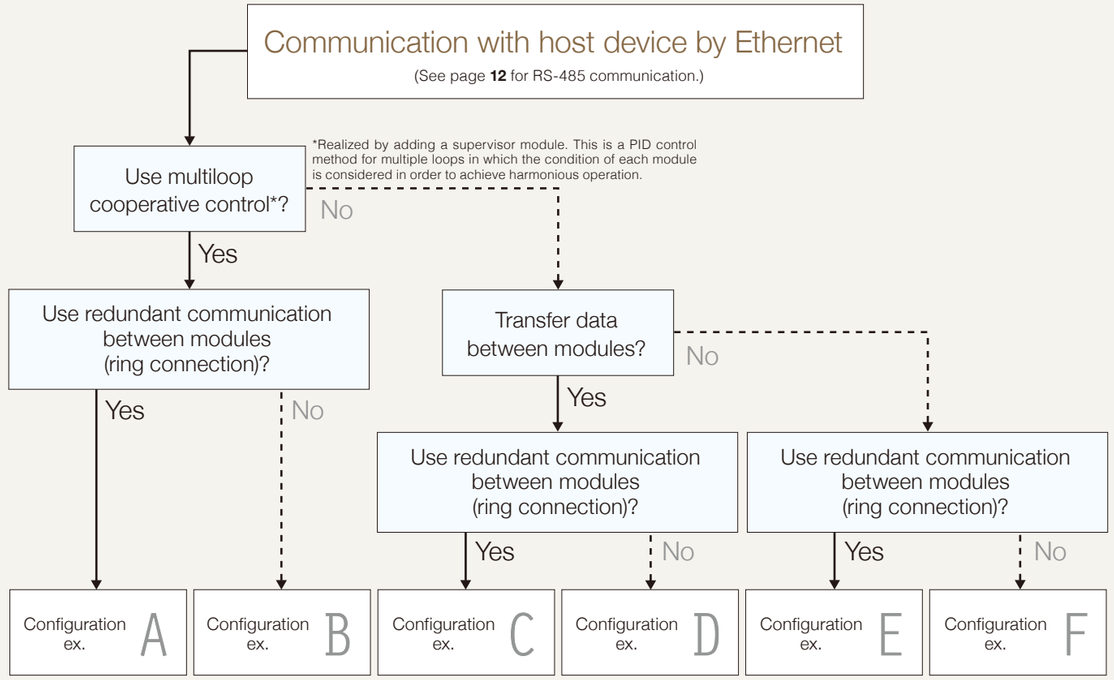
The SLP-NX Smart Loader Package (sold separately) is available for use with Network Instrumentation Modules.

- A PC can be connected to modules via Ethernet.
- Multiple modules* can be controlled at the same time.
  This reduces engineering time and improves the efficiency of testing operations too.
- Individual modules can also be set up by connection a dedicated loader cable.

*The maximum number of modules is 31(excluding communication box/adapter and terminal adapter).



# Module Selection Flow Chart [ for Ethernet communication ]




### A


"Ring connection 1" for CB ▶ R (ring)
"Ring connection" for SV and TC ▶ R (ring)
TC ▶ NX-D25 or D35 (up to 8 units)

### B


"Ring connection 1" for CB ▶ N (non-ring)
"Ring connection" for SV and TC ▶ N (non-ring)
TC ▶ NX-D25 or D35 (up to 8 units)

### C


"Ring connection 1" for CB ▶ R (ring)
"Ring connection" for TC ▶ R (ring)
TC ▶ NX-D25 or D35

### D


"Ring connection 1" for CB ▶ N (non-ring)
"Ring connection" for TC ▶ N (non-ring)
TC ▶ NX-D25 or D35

### E


"Ring connection 1" for CB ▶ R (ring)
"Ring connection" for TC ▶ R (ring)
TC ▶ NX-D15 or D25 or D35

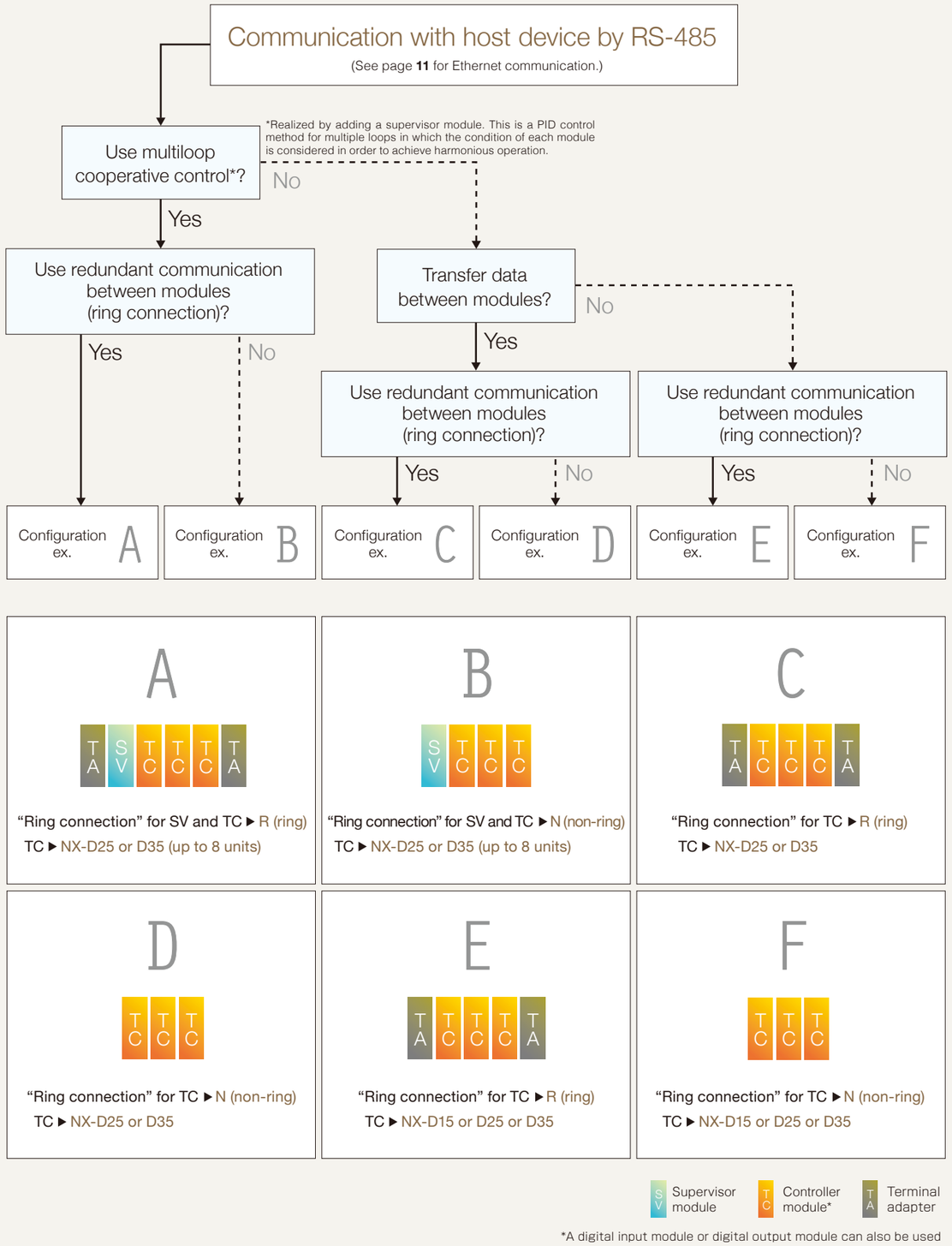
### F


"Ring connection 1" for CB ▶ N (non-ring)
"Ring connection" for TC ▶ N (non-ring)
TC ▶ NX-D15 or D25 or D35

CB Communication box
SV Supervisor module
TC Controller module*
CA Communication adapter
TA Terminal adapter

*A digital input module or digital output module can also be used

# Module Selection Flow Chart [ for RS-485 communication ]




*A digital input module or digital output module can also be used



**Shared specifications (all models)**

| Standard conditions | | Operating conditions | | Other | |
|---|---|---|---|---|---|
| Ambient temperature | 23 ± 2°C | Ambient temperature | 0 to 50°C (below the installed module) | Insulation resistance | 500 Vdc, 20 MΩ min. |
| Ambient humidity | 60 ± 5% RH (without condensation) | Ambient humidity | 10 to 90%RH (without condensation) | Dielectric strength | 500 Vac, 1min |
| Rated supply voltage | 24 Vdc | Allowable supply voltage | 21.6 to 26.4 Vdc | Case material | Modified PPO resin |
| Mounting angle | Reference plane ± 3° | Mounting angle | Reference plane ± 3° | Mounting method | DIN rail |

## Controller Module ··· Process controller (4-channel or 2-channel)

### Model Selection...NX-D15/25/35 (Model 4-channel)

| Basic model No. | Type | Ring connection | Wiring method | Control loops | Output type | Option | Addition | Description |
|---|---|---|---|---|---|---|---|---|
| NX– | | | | | | | | Network Instrumentation Module |
| | D15 | | | | | | | Controller module ±0.3 % FS, 500 ms sampling, 4 loops *1 |
| | D25 | | | | | | | Controller module ±0.3 % FS, 200 ms sampling, 4 loops |
| | D35 | | | | | | | Controller module ±0.1 % FS, 100 ms sampling, 4 loops |
| | | N | | | | | | Non-ring connection |
| | | R | | | | | | Ring connection |
| | | | T | | | | | Screw terminal block |
| | | | S | | | | | Screwless terminal block |
| | | | | 4 | | | | 4 loops |
| | | | | | T | | | Transistor output (4 points) |
| | | | | | C | | | Analog current output (4 points) |
| | | | | | D | | | Analog voltage output (4 points) |
| | | | | | | 0 | | None |
| | | | | | | 1 | | Current transformer input (4 points) |
| | | | | | | 2 | | Digital output (4 points) |
| | | | | | | 3 | | Digital input (4 points) |
| | | | | | | | 0 | None |
| | | | | | | | D | Inspection certificate |
| | | | | | | | Y | Supports traceability certification |
| | | | | | | | T | Tropicalization treatment |
| | | | | | | | K | Anti-sulfide treatment |
| | | | | | | | B | Tropicalization treatment + inspection certificate |
| | | | | | | | L | Anti-sulfide treatment + inspection certificate |

*1. The NX-D15 cannot be used for multi-loop cooperative control and communication between modules.

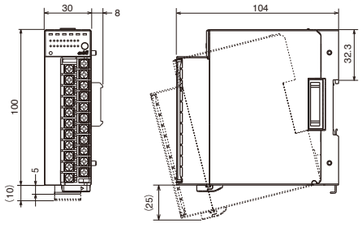
### Model Selection...NX-D35 (Model 2-channel)

| Basic model No. | Type | Ring connection | Wiring method | Control loops | Output type | Option | Addition | Description |
|---|---|---|---|---|---|---|---|---|
| NX– | | | | | | | | Network Instrumentation Module |
| | D35 | | | | | | | Controller module ±0.1 % FS, 100 ms sampling, 2 loops |
| | | N | | | | | | Non-ring connection |
| | | R | | | | | | Ring connection |
| | | | T | | | | | Screw terminal block |
| | | | S | | | | | Screwless terminal block |
| | | | | 2 | | | | 2 loops |
| | | | | | T | | | Transistor output (4 points) |
| | | | | | C | | | Analog current output (4 points) |
| | | | | | D | | | Analog voltage output (4 points) |
| | | | | | M | | | Transistor output (position proportional control) *1 |
| | | | | | S | | | Isolated analog current output |
| | | | | | G | | | Isolated analog voltage output |
| | | | | | | 0 | | None |
| | | | | | | 1 | | Current transformer input (4 points) |
| | | | | | | 2 | | Digital output (4 points) |
| | | | | | | 3 | | Digital input (4 points) |
| | | | | | | 4 | | Digital outputs (2 points, position proportional control) *1*2 |
| | | | | | | | 0 | None |
| | | | | | | | D | Inspection certificate |
| | | | | | | | Y | Supports traceability certification |
| | | | | | | | T | Tropicalization treatment |
| | | | | | | | K | Anti-sulfide treatment |
| | | | | | | | B | Tropicalization treatment + inspection certificate |
| | | | | | | | L | Anti-sulfide treatment + inspection certificate |

*1. Connect an external auxiliary relay. The motor is driven via the auxiliary relay.
*2. If the output type is M, option 4 cannot be selected.

### External dimensions

(unit: mm)




### Specifications overview

**Individual specifications**

**PV inputs**

Number of inputs 4 or 2
Input types

**Thermocouple**

| No. | Type | Range | | Resolution |
|---|---|---|---|---|
| 1 | K | -200 °C | 1200 °C | 1 |
| 2 | K | 0 °C | 1200 °C | 1 |
| 3 | K | 0.0 °C | 800.0 °C | 0.1 |
| 4 | K | 0.0 °C | 600.0 °C | 0.1 |
| 5 | K | 0.0 °C | 400.0 °C | 0.1 |
| 6 | K | -200.0 °C | 400.0 °C | 0.1 |
| 7 | K | -200.0 °C | 200.0 °C | 0.1 |
| 8 | J | 0 °C | 1200 °C | 1 |
| 9 | J | 0.0 °C | 800.0 °C | 0.1 |
| 10 | J | 0.0 °C | 600.0 °C | 0.1 |
| 11 | J | -200.0 °C | 400.0 °C | 0.1 |
| 12 | E | 0.0 °C | 800.0 °C | 0.1 |
| 13 | E | 0.0 °C | 600.0 °C | 0.1 |
| 14 | T | -200.0 °C | 400.0 °C | 0.1 |
| 15 | R | 0 °C | 1600 °C | 1 |
| 16 | S | 0 °C | 1600 °C | 1 |
| 17 | B | 0 °C | 1800 °C | 1 |
| 18 | N | 0 °C | 1300 °C | 1 |
| 19 | PL Ⅱ | 0 °C | 1300 °C | 1 |
| 20 | WRe5-26 | 0 °C | 1400 °C | 1 |
| 21 | WRe5-26 | 0 °C | 2300 °C | 1 |
| 22 | Ni - Mo-Ni | 0 °C | 1300 °C | 1 |
| 23 | PR40-20 | 0 °C | 1900 °C | 1 |
| 24 | DIN U | -200.0 °C | 400.0 °C | 0.1 |
| 25 | DIN L | -100.0 °C | 800.0 °C | 0.1 |
| 26 | Gold-iron Chromel | 0.1 K | 360.1 K | 0.1 |

**RTD**

| No. | Type | Range | | Resolution |
|---|---|---|---|---|
| 41 | Pt100 | -200.0 °C | 500.0 °C | 0.1 |
| 42 | JPt100 | -200.0 °C | 500.0 °C | 0.1 |
| 43 | Pt100 | -200.0 °C | 850.0 °C | 0.1 |
| 44 | JPt100 | -200.0 °C | 640.0 °C | 0.1 |
| 45 | Pt100 | -100.0 °C | 300.0 °C | 0.1 |
| 46 | JPt100 | -100.0 °C | 300.0 °C | 0.1 |
| 47 | Pt100 | -100.0 °C | 200.0 °C | 0.1 |
| 48 | JPt100 | -100.0 °C | 200.0 °C | 0.1 |
| 49 | Pt100 | -50.0 °C | 100.0 °C | 0.1 |
| 50 | JPt100 | -50.0 °C | 100.0 °C | 0.1 |
| 51 | Pt100 | -20.00 °C | 60.00 °C | 0.01 |
| 52 | JPt100 | -20.00 °C | 60.00 °C | 0.01 |

**Linear**

| No. | Type | Range | | Resolution |
|---|---|---|---|---|
| 81 | DC voltage | 0 mV | 10 mV | |
| 82 | | -10 mV | 10 mV | |
| 83 | | 0 mV | 100 mV | |
| 84 | | 0 V | 1 V | |
| 85 | | -1 V | 1 V | |
| 86 | | 1 V | 5 V | |
| 87 | | 0 V | 5 V | |
| 88 | | 0 V | 10 V | |
| 89 | | 2 V | 10 V | |
| 90 | DC current | 0 mA | 20 mA | |
| 91 | | 4 mA | 20 mA | |

Indication accuracy: D35 : ±0.1 % FS ±1digit; D25 : ±0.3 % FS ±1digit; D15 : ±0.3 % FS ±1digit; *Accuracy may vary depending on the sensor type or range.
Sampling cycle: D35 : 100 ms; D25 : 200 ms; D15 : 500 ms

**Motor feedback (MFB) input (output type: M)**

Allowable resistance range: 100 to 2500 Ω; 2.5 to 5k Ω

**Control output (depending on the model number)**

**Transistor output or motor output**

Number of outputs 4
Output type: Transistor output (sink type)
External power rated voltage: 5 to 24 Vdc
Allowable output current: 100 mAdc max.

**Analog current output**

Number of outputs 4
Output current: 4 to 20 mAdc; 0 to 20 mAdc
Allowable load resistance: 300 Ω max. (6.6 Vdc max.); 600 Ω max. (13.2 Vdc max.) (Output type "S")
Output resolution: 1/10000 (range: 4 to 20 mA); 1/12500 (range: 0 to 20 mA)

**Analog voltage output**

Number of outputs 4
Output voltage: 0 to 5 Vdc; 1 to 5 Vdc; 0 to 10 Vdc; 2 to 10 Vdc
Allowable load resistance: 4 kΩ min.
Output resolution: 1/10000 (range: 0 to 5 V); 1/8000 (range: 1 to 5 V); 1/20000 (range: 0 to 10 V); 1/16000 (range: 2 to 10 V)

**Optional functions (depending on the model number)**

**Digital output**

Number of outputs 4
Output type: Transistor (sink type)
External power rated voltage: 5 to 24 Vdc
Allowable output current: 100 mAdc max

**Digital input**

Number of inputs 4
Compatible output type: Non-voltage contacts or transistor (sink type)
Open terminal voltage: DC 5 V ±10 %

**Current transformer input**

Number of inputs 4
Compatible current transformers: QN206A, QN212A (sold separately)
Current measurement range: 0.4 to 50.0 A (RMS)
Indication accuracy: ±5 % FS ±1digit
Indication resolution: 0.1 A

**Other**

Power consumption: 4 W max. (under operating conditions)
Standards compliance: CE (EN61326-1); cUL (UL61010-1)

**Communication specifications**

**Ethernet**

Protocol: MODBUS/TCP, CPL/TCP

**RS-485**

Protocol: MODBUS (RTU/ASCII) CPL
Signal level: RS-485–compliant
Communication/synchronization type: Half-duplex, start/stop synchronization
Maximum cable length: 500 m
Terminating resistor: External (150 Ω, 1/2 W min.)
Transmission speed: 115,200 bps max.

CE : Product approved with the CE Marking. cULus : Product listed by UL covering CSA requirements. : These products are compliant with Korean safety standards.

## Communication Adaptor ··· Ethernet interface (1 port)
## Terminal Adaptor ··· An adaptor used as a ring communications terminal

### Model Selection

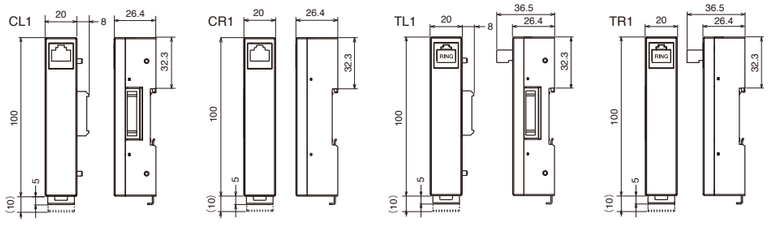
| Basic model No. | Type | Option 1 | Option 2 | Option 3 | Option 4 | Addition | Description |
|---|---|---|---|---|---|---|---|
| NX– | | | | | | | Network Instrumentation Module |
| | CL1 | | | | | | Communication adaptor for left side *1 |
| | CR1 | | | | | | Communication adaptor for right side *1 |
| | TL1 | | | | | | Terminal adaptor for left side (for chain ring connection using side connector) *1 |
| | TR1 | | | | | | Terminal adaptor for right side (for chain ring connection using side connector) *1 |
| | | 0 | | | | | None |
| | | | 0 | | | | None |
| | | | | 00 | | | None |
| | | | | | 0 | | None |
| | | | | | | 0 | None |
| | | | | | | D | Inspection certificate |
| | | | | | | T | Tropicalization treatment |
| | | | | | | K | Anti-sulfide treatment |
| | | | | | | B | Tropicalization treatment + inspection certificate |
| | | | | | | L | Anti-sulfide treatment + inspection certificate |

Photo: Communication Adaptor NX-CL1.

*1. Left and right are defined as seen when viewing the front of the unit.

### External dimensions

(unit: mm)




### Specifications overview

**Individual specifications**

(Communication adapter)

**Ethernet interface**

| | |
|---|---|
| Number of ports | 1 |
| Communication path type | IEEE802.3u 100BASE-TX (full duplex, with Auto-MDI/MDI-X) |
| Connector | RJ-45 |
| Cable | UPT cable (4P) Category 5e min. (straight) (both ends, ANSI/TIA/EIA-568-B) |

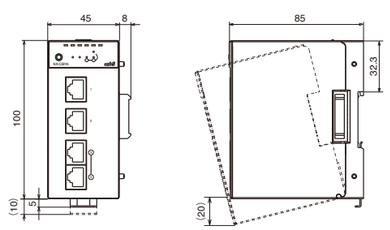
## Communication Box ··· Ethernet interface (switching hub)

### Model Selection

| Basic model No. | Type | Ring connection 1 | Ring connection 2 | Ports | Option | Addition | Description |
|---|---|---|---|---|---|---|---|
| NX– | | | | | | | Network Instrumentation Module |
| | CB2 | | | | | | 4-port switching hub (with status output) |
| | | N | | | | | Chain (side connector) non-ring connection communications |
| | | R | | | | | Chain (side connector) ring connection communications |
| | | | N | | | | Inter-chain (front port) non-ring connection communications |
| | | | R | | | | Inter-chain (front port) ring connection communications |
| | | | | 04 | | | 4 ports |
| | | | | | 0 | | RJ-45×4 |
| | | | | | 1 | | RJ-45×3, 2-core LC×1 |
| | | | | | | 0 | None |
| | | | | | | D | Inspection certificate |
| | | | | | | T | Tropicalization treatment |
| | | | | | | K | Anti-sulfuration treatment |
| | | | | | | B | Tropicalization treatment + inspection certificate |
| | | | | | | L | Anti-sulfide treatment + inspection certificate |

### External dimensions

(unit: mm)




### Specifications overview

**Individual specifications**

**Ethernet interface**

| | |
|---|---|
| Number of ports | 4 (2 of 4 ports are used for ring connection between chains.) |
| Communication path type | Ethernet ports 1 and 2<br>IEEE802.3/IEEE802.3u<br>10BASE-T/100BASE-TX<br>(with auto-negotiation and Auto-MDI/MDI-X)<br>Ethernet ports 3 and 4 (option 0)<br>IEEE802.3u 100BASE-TX (full duplex, with Auto-MDI/MDI-X)<br>Ethernet port 4 (option 1)<br>IEEE802.3u 100BASE-FX (full duplex, wavelength 1300 nm) |
| Connector | 100BASE-TX connector: RJ-45<br>100BASE-FX connector: 2-core LC |
| Cable | 100BASE-TX cable<br>UTP cable (4P), category 5e min. (straight) (both ends, ANSI/TIA/EIA-568-B), 100 m max.<br>100BASE-FX cable<br>Multi-mode graded index optical fiber, GI-50/125 or GI-62.5/125 (2-cores), 2 km max. |

**Other**

| | |
|---|---|
| Power consumption | 4 W max. (option 0 under operating conditions)<br>5 W max. (option 1 under operating conditions) |

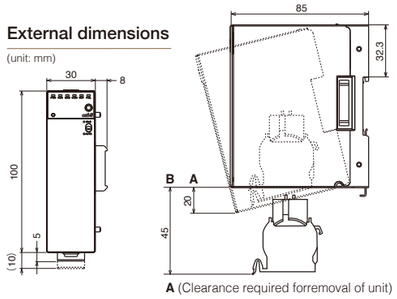
## Supervisor Module ··· Multi-loop harmonized operation controller

### Model Selection

| Basic model No. | Type | Ring connection | Option 1 | Option 2 | Option 3 | Addition | Description |
|---|---|---|---|---|---|---|---|
| NX– | | | | | | | Network Instrumentation Module |
| | S11 | | | | | | Supervisor module control of temperature difference between zones |
| | S12 | | | | | | Supervisor module optimal start-up control |
| | S21 | | | | | | Supervisor module peak power suppression control |
| | | N | | | | | Non-ring connection |
| | | R | | | | | Ring connection |
| | | | 0 | | | | None |
| | | | | 00 | | | None |
| | | | | | 0 | | None |
| | | | | | 1 | | With fault DO |
| | | | | | | 0 | None |
| | | | | | | D | Inspection certificate |
| | | | | | | T | Tropicalization treatment |
| | | | | | | K | Anti-sulfide treatment |
| | | | | | | B | Tropicalization treatment + inspection certificate |
| | | | | | | L | Anti-sulfide treatment + inspection certificate |

### External dimensions

(unit: mm)




**A** (Clearance required forremoval of unit)

**B** (Clearance required forremoval of battery holder)

### Specifications overview

**Individual specifications**

**Other**

| | |
|---|---|
| Power consumption | 4 W max. (under operating conditions) |
| Timekeeper IC | Built-in RTC, ± 2.2 s/day, with calendar |
| Battery life | 3 years (without power-on, under standard conditions) |

**Communication specifications**

**Ethernet**

| | |
|---|---|
| Protocol | MODBUS/TCP, CPL/TCP |

**RS-485**

| | |
|---|---|
| Protocol | MODBUS (RTU/ASCII)<br>CPL |
| Signal level | RS-485 – compliant |
| Communication /synchronization type | Half-duplex, start/stop synchronization |
| Maximum cable length | 500 m |
| Terminating resistor | External (150 Ω, 1/2 W min.) |
| Transmission speed | 115,200 bps max. |

## Digital Input Module ··· Digital and pulse input module (16 inputs)

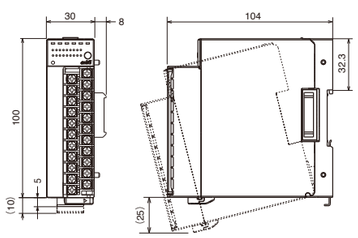
### Model Selection

| Basic model No. | Type | Ring connection | Wiring method | Channels | Option | Addition | Description |
|---|---|---|---|---|---|---|---|
| NX– | | | | | | | Network Instrumentation Module |
| | DX1 | | | | | | Digital input (shared by + common and – common) |
| | DX2 | | | | | | Pulse input (shared by + common and – common) *1 |
| | | N | | | | | Non-ring connection |
| | | R | | | | | Ring connection |
| | | | T | | | | Screw terminal block |
| | | | S | | | | Screwless terminal block |
| | | | | 16 | | | 16 channels |
| | | | | | 0 | | None |
| | | | | | | 0 | None |
| | | | | | | D | Inspection certificate |
| | | | | | | T | Tropicalization treatment |
| | | | | | | K | Anti-sulfide treatment |
| | | | | | | B | Tropicalization treatment + inspection certificate |
| | | | | | | L | Anti-sulfide treatment + inspection certificate |

*1. Channels 1–8 : 5 kHz. Channels 9–16 : 100 Hz.

### External dimensions

(unit: mm)




### Specifications overview

**Individual specifications**

**Input specifications**

| | |
|---|---|
| Number of inputs | 16 |
| Pulse input frequency | DX2 : 5 kHz (max.) channels 1–8<br>DX2 : 100 Hz (max.) channels 9–16 |
| Common terminal | 2 common terminals for every 8 inputs |
| Insulation between channels | On basis of channels 1–8 and 9–16 |
| Rated input voltage | 24 Vdc |
| Rated input current (at 24 Vdc) | DX1: channels 1–16, 4.5 mA approx.<br>DX2: channels 1–8, 6.4 mA approx.<br>channels 9–16, 4.5 mA approx. |
| Input impedance | DX1: channels 1-16, 4.7 kΩ approx.<br>DX2: channels 1-8, 3.3 kΩ approx.<br>channels 9-16, 4.7 kΩ approx. |
| Input type | Shared by + common and – common |
| Compatible output type | Dry contact or transistor |

**Event output (for DX2 only)**

| | |
|---|---|
| Number of outputs | 1 |
| Insulation | Yes |
| Output type | Photo MOS relay output (non-voltage From A contact) |
| Rated contact voltage | 12-24 Vdc |
| Allowable output current | 100 mAdc max. |

**Other**

| | |
|---|---|
| Power consumption | 4 W max. (under operating conditions) |

**Communication specifications**

**Ethernet**

| | |
|---|---|
| Protocol | MODBUS/TCP, CPL/TCP |

**RS-485**

| | |
|---|---|
| Protocol | MODBUS (RTU/ASCII)<br>CPL |
| Signal level | RS-485 – compliant |
| Communication /synchronization type | Half-duplex, start/stop synchronization |
| Maximum cable length | 500 m |
| Terminating resistor | External (150 Ω, 1/2 W min.) |
| Transmission speed | 115,200 bps max. |



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